

REMARKS

By this Amendment, Applicants have canceled claims 40, 59, and 61 without prejudice or disclaimer; amended claims 19-25, 38-39, 41-49, 52-58, and 60; and added new claims 63-73. No new matter has been added. Claims 9-18 and 26-37 have been withdrawn from consideration as directed to claims non-elected without traverse. Thus, claims 1-8, 19-25, 38, 39, 41-58, 60, and 62-73 are pending on the merits.

In the Office Action, the Examiner rejected claims 19-62 under 35 U.S.C. § 102(e) as being anticipated by Takahashi et al. (U.S. Patent No. 6,518,547); and allowed claims 1-8.

As an initial matter, Applicants greatly appreciate the Examiner's indication that claims 1-8 are allowed. Applicants consider the Examiner's statement of reasons for allowance to be merely one possible reason for the allowance of claims 1-8, not the sole reason.

Rejection under 35 U.S.C. § 102(e) based on Takahashi et al.

With respect to the rejection of claims 19-62 under 35 U.S.C. § 102(e) as being anticipated by Takahashi et al., claims 19, 25, 43, 49, and 54 are the only independent claims rejected under § 102(e) based on the Takahashi et al. reference. Applicants have amended independent claims 19, 25, 43, 49, and 54, thereby obviating the rejection of those claims. To the extent, however, that the Examiner may consider asserting a rejection of those claims based on the Takahashi et al. reference, Applicants respectfully submit that the Takahashi et al. reference cannot anticipate any of Applicants' independent claims 19, 25, 43, 49, and 54, as amended, because the

Takahashi et al. reference does not disclose all of the subject matter recited in each of those claims. See M.P.E.P. § 2131.

Amended Independent Claim 19

Applicants' invention as recited in amended independent claim 19 is directed to a heating unit for heating an object to be heated. The heating unit includes a plurality of lamps used as a heat source. Each of the lamps have an illuminant generating a light. The heating unit further includes a lamp support part supporting the lamps and an inner surface covering the illuminant so as to reflect the light generated by the illuminant. The inner surface has a curvature so as to reflect the light generated by the illuminant in a direction toward the object, and the inner surface reflecting the light generated by the illuminant extends to a backside of the illuminant with respect to the direction toward the object.

The Takahashi et al. reference does not disclose or suggest a heating unit including an inner surface of an illuminant having a curvature so as to reflect the light generated by the illuminant in a direction toward the object, wherein the inner surface reflecting the light generated by the illuminant extends to a backside of the illuminant with respect to the direction toward the object.

In contrast to Applicants' invention as recited in amended independent claim 19, the Takahashi et al. reference discloses a substrate heat treatment apparatus 1 having an irradiation part 11 including lamps 11a through 11c, a base plate 111, and reflectors 112. The base plate 111 is a discoidal member having a larger diameter than

a substrate W to be heated and is horizontally provided above the substrate W in opposition thereto to cover the overall surface of the substrate W.

Referring to Fig. 3 of the Takahashi et al. reference, each reflector 112 has an axisymmetrical shape about a Z-axis and a cylindrical side surface, and is provided with a through hole 112a therein. The inner surface of the through hole 112a defines a gold-plated reflecting surface 112b for reflecting the light emitted from the lamp 11a, 11b, or 11c via filament 110b. The reflecting surface 112b has a cylindrical first reflecting surface R1 on upper end and a second reflecting surface R2 connected with the lower end (a connecting portion CP) of the first reflecting surface R1. The second reflecting surface R2 has an inverted elliptic semispherical surface shape or an inverted parabolic semispherical surface shape with respect to the substrate W. The central axes of the mounting hole 111a of the base plate 111 and the through hole 112a of the reflector 112 are substantially concentric along the Z-axis direction, and the mounting hole 111a and the through hole 112a are substantially identical in diameter to each other. The mounting hole 111a and the through hole 112a of the reflector 112 substantially continue with each other, thereby defining a single hole. The lamp 11a, 11b, or 11c mounted in the mounting hole 111a.

In other words, by virtue of the through hole 112a and the mounting hole 111a having substantially the same diameter, the reflecting surface R2 is terminated at connecting portion CP. As a result, the reflecting portion R2 does not extend to a backside of the filament 110b with respect to the direction toward the object. Consequently, a substantial portion of the light emitted from the filament 110b in a direction away from the object W to be heated cannot be reflected back toward the

object W, thereby possibly degrading the efficiency of the heating. Therefore, the Takahashi et al reference does not disclose a heating unit including an inner surface of an illuminant having a curvature so as to reflect the light generated by the illuminant in a direction toward the object, wherein the inner surface reflecting the light generated by the illuminant extends to a backside of the illuminant with respect to the direction toward the object, as recited in amended independent claim 1. Thus, the Takahashi et al. reference cannot anticipate Applicants' amended independent claim 19.

Amended Independent Claim 25

Applicants' invention as recited in amended independent claim 25 is directed to a heat treatment apparatus for applying a heat treatment to an object to be processed. The heat treatment apparatus includes a support member on which the object to be processed is placed, and a heating unit having a plurality of lamps located above the support member for heating the object to be processed. Each of the lamps includes an illuminant generating a light and an inner surface covering the illuminant so as to reflect the light generated by the illuminant. The inner surface has a curvature so as to reflect the light generated by the illuminant in a direction toward the object, and the inner surface reflecting the light generated by the illuminant extends to a backside of the illuminant with respect to the direction toward the object.

As outlined above with respect to claim 19, the Takahashi et al. reference does not disclose at least a heating unit including an inner surface of an illuminant having a curvature so as to reflect the light generated by the illuminant in a direction toward the object, wherein the inner surface reflecting the light generated by the illuminant extends

to a backside of the illuminant with respect to the direction toward the object. Therefore, the Takahashi et al. reference does not disclose all of the subject matter recited in amended independent claim 25 and cannot anticipate that claim.

Amended Independent Claim 43

Applicants' invention as recited in amended independent claim 43 is directed to a heating unit for heating an object to be heated. The heating unit includes a plurality of lamps used as a heat source, a lamp support part supporting the lamps, an illuminant generating a light, and a reflective part reflecting the light generated by the illuminant. The reflective part has a face so as to emit the light generated by the illuminant in a direction toward the object by one time reflection, and the inner surface reflecting the light generated by the illuminant extends to a backside of the illuminant with respect to the direction toward the object.

For at least reasons similar to those outlined above with respect to claim 19, the Takahashi et al. reference does not disclose or suggest at least a heating unit including an inner surface of an illuminant having a curvature so as to reflect the light generated by the illuminant in a direction toward the object, wherein the inner surface reflecting the light generated by the illuminant extends to a backside of the illuminant with respect to the direction toward the object. Accordingly, the Takahashi et al. reference fails to disclose all of the subject matter recited in Applicants' amended independent claim 43. Therefore, amended independent claim 43 should be allowable.

Amended Independent Claim 49

Applicants' invention as recited in amended independent claim 49 is directed to a heat treatment apparatus for applying a heat treatment to an object to be processed. The heat treatment apparatus includes a support member on which the object to be processed is placed, a heating unit having a plurality of lamps located above the support member for heating the object to be processed. Each of the lamps includes an illuminant generating a light, a reflective part reflecting the light generated by the illuminant, and a projection face facing the illuminant so as to project the light emitted from the illuminant and the light reflected by the reflective part. The reflective part has a face so as to emit the light generated by the illuminant toward the object by one time reflection, and the reflective part extends to a backside of the illuminant opposite to the projection face.

For at least reasons similar to those outlined above with respect to amended independent claim 43, amended independent claim 49 should be allowable.

Amended Independent Claim 54

Applicants' invention as recited in amended independent claim 54 is directed to a heating unit for heating an object to be heated. The heating unit includes a plurality of lamps used as a heat source. Each of the lamps has a light-emitting part, a lamp support part supporting the lamps, and an electrode part configured and arranged to be supplied with an electric power and connected to the light-emitting part via a middle part located between the light-emitting part and the electrode part. The light-emitting part includes an illuminant generating a light, and the illuminant is connected to the electrode

part. A reflective part has a face so as to emit the light generated by the illuminant substantially in the same direction by one time reflection. The projection face faces the illuminant so as to project the light emitted from the illuminant and the light reflected by the reflective part toward the object, and the reflective part extends to a backside of the illuminant opposite to the projection face.

For at least reasons similar to those outlined above with respect to amended independent claim 43, amended independent claim 54 should be allowable.

Conclusions

Accordingly, Applicants respectfully submit that independent claims 1, 8, 19, 25, 43, 49, and 54 are allowable. Furthermore, Applicants submit that claims 2-7, 20-24, 38-42, 44-48, 50-53, 55-62, and new dependent claims 63-73 are allowable by virtue of their dependency on their corresponding independent claims 1, 8, 19, 25, 43, 49, and 54, as well by their additional recitations of novel and non-obvious subject matter. Therefore claims 1-8, 19-25, 38, 39, 41-58, 60, and 62-73 should be allowable.

Applicants respectfully request reconsideration and reexamination of this application, and timely allowance of the pending claims.

If the Examiner believes that a telephone conversation might advance prosecution, the Examiner is cordially invited to call Applicants' representative at 571-203-2739.

Applicants respectfully submit that the Office Action contains numerous assertions concerning the related art and the claims. Regardless of whether those


assertions are specifically addressed herein, Applicants decline to automatically
subscribe to them.

Please grant any extensions of time required to enter this response and charge
any additional required fees to our Deposit Account No. 06-0916.

Respectfully submitted,

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